[57] **ABSTRACT**

Improved point source electromagnetic radiation emitters including a dispersing element that radiates electromagnetic radiation over a very wide conical angle of approaching about 180°. This light dispersing element can be in any one or more of several illustrated forms such as a light diffusing spherical or hemispherical element, a planar diffusing plate, a tapered light guide, a plano-concave lens, a convex mirror, a light pipe with a large numerical aperture, or the like. The emitter of this invention may be fixed to an object and tracked in a 3-dimensional volume by a system using electro-optical position sensors in order to determine the spatial location of the emitters and therefore to determine, by geometry, the position and orientation of the object. The electromagnetic radiation generator is preferably disposed remote from the emitter and is electrically and magnetically isolated from the emitter. A common optical fiber provides transmission of the radiation from the generator to the emitter. The emitted radiation more nearly resembles point source of radiation and therefore enables more accurate determination of the location of the radiating element, and thereby more accurate determination of the position and orientation of the object on which the emitters reside. The preferred electromagnetic radiation generator is an LED, most preferably a laser diode.